Leave blank

1. (a) Given that $\sin^2\theta + \cos^2\theta \equiv 1$, show that $1 + \tan^2\theta \equiv \sec^2\theta$.

(2)

(b) Solve, for $0 \leqslant \theta < 360°$, the equation

$$2\tan^2\theta + \sec\theta = 1,$$

giving your answers to 1 decimal place.

(6)

a) $\sin^2\theta + \cos^2\theta \equiv 1$

$\frac{\sin^2\theta}{\cos^2\theta} + \frac{\cos^2\theta}{\cos^2\theta} \equiv \frac{1}{\cos^2\theta}$

$\tan^2\theta + 1 \equiv \sec^2\theta$

$1 + \tan^2\theta \equiv \sec^2\theta$

b) $2\tan^2\theta + \sec\theta = 1$

$2(\sec^2\theta - 1) + \sec\theta = 1$

$2\sec^2\theta - 2 + \sec\theta - 1 = 0$

$2\sec^2\theta + \sec\theta - 3 = 0$

$(2\sec\theta + 3)(\sec\theta - 1) = 0$

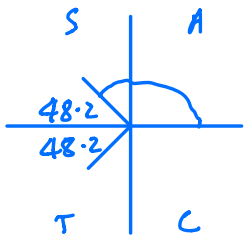
$\Rightarrow \sec\theta = -\frac{3}{2}$ $\quad \sec\theta = 1$

$\cos\theta = -\frac{2}{3}$ $\quad \cos\theta = 1$

$\theta = 0°$

N 2 3 4 9 4 B 0 2 2 0

$\cos^{-1}\frac{2}{3} = 48.2^\circ$



$$\begin{cases} \theta = 0^\circ \\ \theta = 131.8^\circ \\ \theta = 228.2^\circ \end{cases}$$